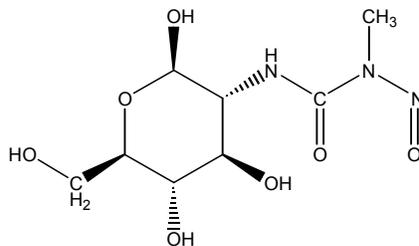


STREPTOZOTOCIN

CAS No. 18883-66-4

First Listed in the *Second Annual Report on Carcinogens*



CARCINOGENICITY

Streptozotocin is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC 1978, 1982). When administered by intraperitoneal injection, streptozotocin induced increased incidences of kidney and lung tumors in mice of both sexes, and produced uterine tumors in female mice. When administered by intraperitoneal injection, streptozotocin increased the incidences of kidney and pancreatic islet cell tumors in rats of both sexes, liver tumors in female rats, and peritoneal sarcomas in male rats. When administered by intraperitoneal injection, streptozotocin induced cholangiomas and hepatomas in hamsters. When administered as a single intravenous injection, streptozotocin induced kidney adenomas, adenocarcinomas, and sarcomas in rats of both sexes. Intravenous injection of streptozotocin induced hepatomas in hamsters (IARC 1978).

No adequate human studies of the relationship between exposure to streptozotocin and human cancer have been reported (IARC 1974, 1978).

PROPERTIES

Streptozotocin is a mixture of α - and β -stereoisomers. It occurs as pale yellow or off-white crystals, powder, or platelets, while the research grade may be an off-white to tan solid. It is very soluble in water, ketones, and lower alcohols, slightly soluble in polar organic solvents, and insoluble in nonpolar organic solvents. The pure compound is sensitive to humidity and light. Streptozotocin decomposes to diazomethane in alkaline solutions at 0°C. When heated to decomposition, it emits toxic fumes of nitrogen oxides (IARC 1978, HSDB 2001).

USE

Streptozotocin is primarily used in the treatment of metastasizing pancreatic islet cell tumors. It is also effective in treating malignant carcinoid tumors. It has been investigated for use in diabetes, since it has a specific toxic action on pancreatic β -cells. Streptozotocin has also been investigated as a potential antibacterial agent, but has never been used commercially for this purpose (IARC 1978).

PRODUCTION

Streptozotocin is derived from the soil microorganism *Streptomyces achromogenes* and has also been synthesized by three different procedures (IARC 1978). Chem Sources (2001) identified 12 current U.S. suppliers for streptozotocin. The USITC identified two domestic manufacturers of streptozotocin in 1987 and 1988, but no production volumes were reported (USITC 1988, 1989). Prior to 1983, there were two producers of streptozotocin identified by the USITC (USITC 1983). In 1979, U.S. production of streptozotocin was probably greater than 2000 lb (908 kg) (HSDB 2001). No current data on imports or exports of streptozotocin were found.

EXPOSURE

Health professionals such as pharmacists, doctors, and nurses may be exposed to streptozotocin while dispensing, preparing, or administering pharmaceuticals. Potential occupational exposure may occur during streptozotocin production and during the formulation of pharmaceuticals. However, this exposure is site-limited. The National Occupational Exposure Survey (1981-1983) indicated that 2,074 workers, including 1,714 women, potentially were exposed to streptozotocin. This estimate was derived from observations of the actual use of the compound (30% of total observations) and the use of trade name products known to contain the compound (70%) (NIOSH 1984).

REGULATIONS

EPA regulates streptozotocin under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). Under RCRA, it is regulated as a hazardous constituent of waste. A reportable quantity (RQ) of 1 lb has been established for releases of streptozotocin under CERCLA.

FDA regulates streptozotocin as a prescription drug approved for treating metastatic islet cell carcinomas of the pancreas.

OSHA regulates streptozotocin under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table 163.

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